

LITHOLOGY

SYMBOL

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Laguna Springs Volcanic Group

Twin Creek Limestone

Navajo Sandstone

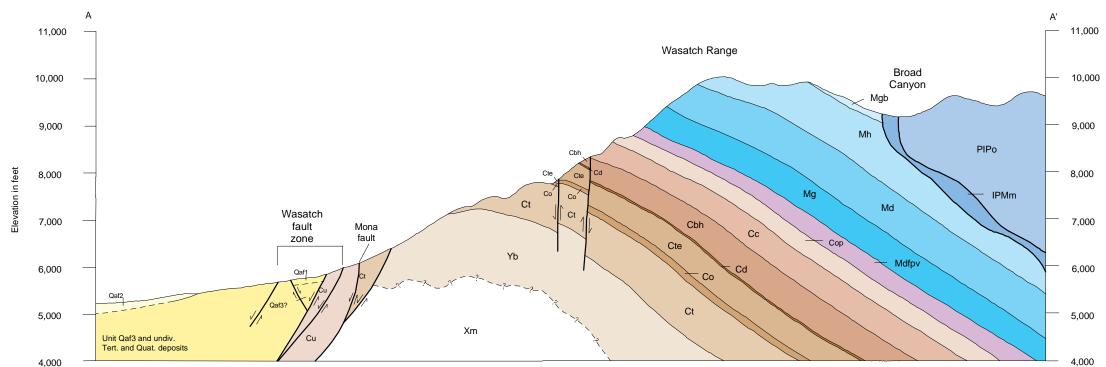
(0-1525)

400 (120)

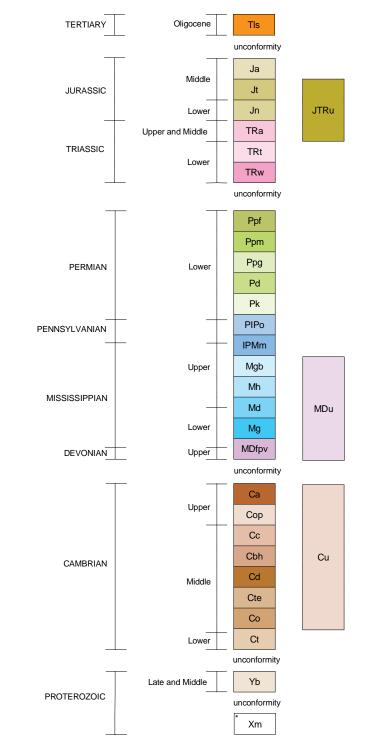
800

(245)

SYSTEM SERIES



750 Ankareh Formation (2 3 0) 1100-1300 (335 - 395) Thaynes Limestone Τt 4,000 400 - 700 Woodside Formation Ŧω (120 - 215) 100 - 500 (30 - 150) Franson Ppf PARK CITY Member PHOSPHORIA Meade Peak FORMATION Phosphatic Sh 0 - 400 (0 -120) 11,000 11,000 FORMATION (45 - 150) 225 - 325 (70 - 100) Diamond Creek Sandstone 10,000 10,000 450-1150 Pk Kirkman Limestone Wasatch Range 9,000 9,000 Quaking Asp Canyon PIPo 8,000 8,000 PPo Oquirrh Formation 7,000 7,000 Wasatch 6,000 6,000 Undivided Triassic and Jurassic rocks 5,000 5,000 4,000 4,000 Manning Canyon Shale MISSISSIPPIAN Great Blue Limestone Мдь (60 - 230) Humbug Formation **CORRELATION OF MAP UNITS** MAP SYMBOLS 800-900 Contact -- dashed where approximately located, colluvial dotted where concealed artificial deposits alluvial deposits lacustrine deposits deposits deposits Gardison Limestone Μg Fault -- dashed where approximately located (or inferred), (140 - 200) itchville Formation, dotted where concealed; bar and ball on downthrown side Pinyon Peak Limestone, and 250-350 MDfpv Qfh Qfl — ▲ ▲ - · · ▲ · · Thrust fault -- dashed where approximately located (or inferred), Qaf1 150 (45) dotted where concealed, queried where uncertain, teeth on upper plate Ajax(?) Dolomite €a Qcg 100-600 Opex Formation Qaf2 Shorelines -- shorelines of the Bonneville Lake cycle. Hachures point QUATERNARY Qls Qli Qlu Qla upper downslope. Symbol Bv indicates highest shoreline, which is at approximately 5,095 ft elevation 350 - 500 Qms Cole Canyon Dolomite €c (105 - 150) Pleistocene 400 - 500 Qaf3 Bluebird Dolomite, and Escarpments -- at the head of or within landslide or rock-fall deposits. middle (120 - 150) erkimer Limestone, undivided Hachures point downslope 10-30 (3-10) 400 (120) €d Dagmar Dolomite Syncline -- showing direction and amount of plunge Ete Teutonic Limestone 175 - 275 (55 - 85) Ophir Formation €° 800-1000 TERTIARY Oligocene Tls Strike and dip of bedding -- horizontal, inclined, vertical, overturned Tintic Quartzite €ŧ (245-305) unconformity Prospect 450 - 500 Ja Υъ Big Cottonwood Formation Qli/Qms Stacked map units -- thin or discontinuous cover of one unit over another (140 - 150) JURASSIC Jt TRa Upper and Middle TRIASSIC TRt Lower DESCRIPTION OF MAP UNITS TRw



* shown in cross section only

- alluvium. Coarse grained poorly corted candy gravel in
- Stream alluvium Coarse-grained, poorly sorted sandy gravel in active stream channels and low terraces. Soils are weak azonal (A horizon) to weak zonal with A and weakly developed calcic B horizons. Thickness is unknown, but probably 5 to 15 feet (2-5 m), locally more in channels. Best developed in Willow Creek, east of the Wasatch fault zone.
- Qaf₁ Young alluvial-fan deposits Coarse-grained, poorly sorted sand to sandy gravel deposits that form active fan surfaces. A large component of the deposits is composed of locally derived debris-flow material, which commonly has matrix (silt to sand) support of gravel clasts. Soils are typically weak azonal (A horizon) to weak zonal with A and weakly developed calcic or cambic B horizons. Thickness is unknown, but probably 5 to 5 feet (2-5 m).
- Qaf₂
 Old alluvial-fan deposits Coarse-grained, poorly sorted sand to sandy gravel deposits that form inactive fan surfaces. A large component of the deposits is composed of locally derived debris-flow material, which commonly has matrix (silt to sand) support of gravel clasts. Soils are typically zonal with A and weakly developed calcic (stage I or II) B horizons or cambic B horizons. Thickness is unknown, but probably 5 to 15 feet (2-5 m).
- Qaf₃ Oldest alluvial-fan deposits Coarse-grained, poorly sorted sand to sandy gravel deposits that form uplifted remnants of fan surfaces. A large component of the deposits is composed of locally derived debris-flow material, which commonly has matrix (silt to sand) support of gravel clasts. Soils are typically zonal with A and moderate to strongly developed calcic (stage III to IV) B horizons or argillic B horizons. Thickness is unknown, but probably 5 to 15 feet
- Qac Alluvium with a large component of colluvium Unit commonly forms thin (5 to 15 feet [2-5 m] thick) blanket of locally derived material on bedrock or adjacent to stream channels in the mountains. Soils are similar to those on units Qaf₁ and Qaf₂.
- Young lacustrine deposits Predominantly silt and sand of Mona Reservoir. Consists mainly of reworked material from unit Qli (old lacustrine silt). Mapped at and below maximum level of spillway. Thickness is unknown, but probably less than 5 feet (<2 m).
- Old lacustrine sand Sand of the transgressive cycle of the most recent high stand of Lake Bonneville. Forms thin (3 to 10 feet [1-3 m] thick) apron and shoreline deposits that are locally pebbly. Soil are typically zonal with A and weakly developed calcic (stage I or II) B horizons or cambic B horizons. Shorelines poorly developed in Juab Valley owing to the rapid incursion and departure of the lake (see Machette and others, 1992).
- Qli Old lacustrine silt Silt of the transgressive cycle of the most recent high stand of Lake Bonneville. Forms thin (3 to 10 feet [1-3 m] thick) apron that formed in offshore and nearshore quiet-water conditions. Soils are typically zonal with A and weakly developed calcic (stage I or II) B horizons or cambic B horizons.
- Qlu Old lacustrine deposits, undivided Predominantly silt and sand of the transgressive cycle of the most recent high stand of Lake Bonneville. Mapped in areas of poor exposure. Soils are similar to those on unit Qls (old lacustrine sand). Thickness is unknown, but probably less than 15 feet (<5 m).
- Old lacustrine and alluvial deposits, undivided Unit mapped where lacustrine deposits are thin (less than 3 feet [<1 m] thick) or where units intertongue at unmappable scales. Soils are similar to those on unit Qls (old lacustrine sand). Thickness is unknown, but probably less than 15 feet (<5 m).
- Talus (rock-fall deposits) Angular blocks of resistant bedrock on or at the bases of steep slopes, typically along the Wasatch fault zone or along steep canyons in the adjacent range. Older deposits generally have abundant cover of lichens or other weathering features. Thickness is variable, commonly 5 to 15 feet (2-5 m) except where thicker at the bases of slopes.
- Landslide deposits There are three massive and many smaller landslides in the mapped area: (1) the Mona landslide, about 1 mile (1.6 km) north of Willow Creek, which derived from mass movement in the Manning Canyon Shale, (2) the Birch Creek landslide (at the mouth of Birch Creek), which probably derived from mass movement in the Arapien Shale, and (3) an unnamed landslide between Bear and Mona Creeks. In addition, there are remnants of another (probably

- Qcg Gravelly colluvium Poorly sorted, angular to rounded gravel with matrix of sand and silt. Commonly forms thin (5 to 15 feet [2-5 m] thick) blanket of locally derived material on bedrock at base of steep parts of range front. Soils are similar to those on units Qaf₁ and Qaf₂ (alluvial-fan deposits).
- Qfh Artificial fill Mapped along highways and railroad grades.
- Qfl Disturbed ground Areas of artificial fill or re-graded material in abandoned gravel or borrow pits.
- Tls Laguna Springs Volcanic Group Dark- to very dark-gray and red or tan andesitic agglomerate; andesitic clasts consist of small phenocrysts of plagioclase, biotite, hornblende, and augite in a very fine-grained to aphanitic groundmass. Thickness in quadrangle is not known but elsewhere on Long Ridge may be as thick as 1,000 feet (305 m)
- Arapien Shale Thin-bedded gray-green to olive-green argillaceous limestone; local red mudstone, gray limestone, and gypsum. Thickness in quadrangle is not known.
- JTRu Twin Creek Limestone, Navajo Sandstone, and Ankareh Formation, undivided.
- Twin Creek Limestone Upper half of unit: thin bed of red mudstone underlain by dark gray-brown to light- and medium-gray limestone. Lower half of unit: interbedded olive-green argillaceous limestone and brown sandstone, underlain by, in descending order, argillaceous limestone, finely crystalline limestone, and oolitic limestone, all of which weather to brown or olive gray. All limestones are locally fossiliferous. Thickness is approximately 400 feet (120 m).
- Jn Navajo Sandstone Buff to tan quartzitic sandstone; red or reddishbrown near base, massive in outcrop, locally with large-scale crossbedding. Thickness may be as much as 800 feet (245 m).
- TRa Ankareh Formation Reddish-brown to tan mudstone, siltstone, and sandstone. Incomplete thickness in quadrangle is 750 feet (230 m).
- TRt Thaynes Limestone In descending order: light-gray-weathering limestone; greenish-brown weathering limestone; red-weathering siltstone and sandstone; greenish- to reddish-brown-weathering argillaceous limestone, locally with interbedded reddish-brown sandstone and siltstone. All limestone is flaggy weathering and contains brown and white chert nodules. Thickness is 1,100 to 1,300 feet (335-395 m).
- TRw Woodside Formation Interbedded mudstone, siltstone, and micaceous quartzitic sandstone, all weathering to shades of red, reddish gray, and light brown. Underlies vegetated saddles and slopes. Apparent thickness varies from 400 to 700 feet (120-215 m) due to structural complications.
- Ppf Franson Member, Park City Formation Medium- to very thick-bedded, light-gray- or tan-weathering dolomite, commonly with white or tan chert nodules; uppermost part of unit marked by light-gray fossiliferous limestone with abundant brachiopods and bryozoans. Apparent thickness varies from less than 100 to 500 feet (<30-150 m) due to structural complications.
- Ppm Meade Peak Phosphatic Shale Member, Phosphoria Formation –
 Thinly-interbedded tan to brown dolomite and black chert, present in
 approximately equal amounts. Pelletal or oolitic phosphate at base of
 unit. Exposed thickness varies from 0 to 400 feet (0-120 m).
- Ppg Grandeur Member, Park City Formation Well-bedded, light- to medium-gray dolomite and cherty dolomite interbedded with quartzitic sandstone with well-sorted and well-rounded grains. Small nodules of white chert common in dolomite throughout unit, except near base, where dolomite is tan and contains abundant black chert. Uppermost part of unit marked by light-gray fossiliferous limestone. Thickness varies from 150 to 500 feet (45-150 m) due to structural complications.
- Diamond Creek Sandstone Yellow- to tan-weathering, calcareous, quartzitic sandstone with well-rounded and well-sorted grains; massive in outcrop, locally cross-bedded. Exposed thickness varies from 450 to 1.150 (set (140-350 m).

- Po Oquirrh Formation Interbedded limestone and sandstone with minor amounts of shale. Limestone is thin- to thick-bedded, light-gray- or blue-gray-weathering; silty or sandy limestone weathers to tan or brown. Quartzitic sandstone is medium to coarse grained, weathers to gray or tan. Upper part of unit includes tan-weathering silty limestone with locally abundant fusulinids. Thickness in Mona quadrangle is 15,000 to 16,000 feet (4,573-4,878 m).
- IPMm Manning Canyon Shale Very dark-brown to black mudstone and shale with interbedded brown to greenish-brown quartzitic sandstone composed of well-sorted, well-rounded, coarse- to medium-size quartz grains. Thickness not known, but may be about 1,000 feet
- MDu Great Blue Limestone, Humbug Formation, Deseret Limestone, Gardison Limestone, Fitchville Formation, Pinyon Peak Limestone,

and Victoria Formation, undivided.

- Mgb Great Blue Limestone Thin- to medium-bedded gray or blue-gray limestone; massive in outcrop, locally fossiliferous and cherty.

 Thickness varies from 200 to 750 feet (60-230 m) due to structural
- Mh Humbug Formation Interbedded sandstone, limestone, and dolomite. Tan- to reddish-brown-weathering sandstone mostly consists of well-rounded, medium-size quartz grains and calcareous cement; thin- to medium-bedded limestone and dolomite are light- to medium-gray or blue-gray weathering; silty or sandy carbonate rocks are tan weathering. Thickness ranges from 900 to 1,000 feet (275-
- Md Deseret Limestone Interbedded dolomite and limestone; both are light- to medium-gray, well-bedded, coarsely crystalline, and contain abundant lenses or beds of black chert. Black mudstone and shale with dark phosphatic pelletal and oolitic material at base of unit. Thickness varies from 800 to 900 feet (245-275 m).
- Mg Gardison Limestone Platy-weathering, coarsely-crystalline, locally very fossiliferous, medium- to dark-gray or blue-gray limestone and dolomite, both with abundant beds of black chert. Thickness varies from 450 to 650 feet (140-200 m) with an average of 550 to 600 feet (170-185 m)
- MDfpv Fitchville Formation, Pinyon Peak Limestone, and Victoria Formation, undivided Upper and lower dolomite intervals, separated by 5- to 10-foot-thick (1.5-3 m) interval of quartzite. Upper dolomite interval is light gray, argillaceous, silty and sandy near base, and includes several zones of very finely crystalline, medium blue-gray limestone. Middle quartzite is thin bedded, well bedded, with very well-sorted, medium to coarse quartz grains. Lower dolomite interval is light gray, medium to coarsely crystalline, locally fossiliferous, and slightly argillaceous near the base. Thickness varies from 250 to 350 feet (75-100 m).
- Cu Ajax(?) Dolomite, Opex Formation, Cole Canyon Dolomite, Bluebird Dolomite, Herkimer Limestone, Dagmar Dolomite, Teutonic

Limestone, and Ophir Formation, undivided.

- Ca Ajax(?) Dolomite Thin-bedded, coarsely-crystalline, medium-gray dolomite with very abundant, discontinuous thin beds of gray to white chert. Thickness is 150 feet (45 m).
- Cop Opex Formation Interbedded limestone and shale with minor dolomitic sandstone and argillaceous dolomite. Limestone is thin bedded, light gray to light blue gray, locally oolitic, with abundant intraformational conglomerate. Shale and argillite are medium gray and weather to tan, buff, and yellow. Thickness is generally 400 to 600 feet (120-180 m).
- c Cole Canyon Dolomite Zones of medium-bedded to locally laminated, very light-gray to creamy-white dolomite that alternate with zones of medium- to thick-bedded, medium-gray to very dark-gray, commonly mottled dolomite, locally with small twig-like structures of coarsely crystalline white dolomite. Thickness varies from 350 to 500 feet (105-150 m).
- Cbh Bluebird Dolomite and Herkimer Limestone, undivided Upper part consists of medium- to thick-bedded, very dark-gray dolomite with small twig-like structures of coarsely crystalline white dolomite.

 Lower part is interbedded, medium- to dark-gray or blue-gray, thinto medium-bedded dolomite and limestone. locally colitic, with

- Teutonic Limestone Thin- to medium-bedded, dark-gray to bluegray limestone and interbedded dolomite, commonly with interbedded gray-, tan-, and orange-weathering argillaceous limestone. Thickness is approximately 400 feet (120 m).
- Ophir Formation Upper and lower shale members separated by medial limestone member. Upper shale member is thin bedded, micaceous, slightly calcareous, and greenish gray. Medial limestone member is thin-bedded, dark blue-gray limestone and interbedded gray to grayish-tan argillaceous limestone. Lower shale member is greenish brown to greenish gray, with thinly-interbedded dark blue-gray limestone near its top and thinly-interbedded slightly-calcareous sandstone near its base. Thickness varies from 175 to 275 feet (55-85
 - Tintic Quartzite Pink, buff, gray, and white quartzite that is well-bedded, texturally mature, commonly cross-bedded, and locally conglomeratic. Includes dark-maroon to dark-purple altered basalt(?) flow near base. Thickness varies from 800 to 1,000 feet (245-305 m).
- Big Cottonwood Formation Shale, siltstone, sandstone, quartzite, and quartz-pebble conglomerate, generally dark-colored in shades of gray, green, maroon, and purple. Exposed thickness in quadrangle is 450 to 500 feet (140-150 m).

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Early Proterozoic high-grade metamorphic rocks - Shown in cross section only.